Claims:

1. A method of removing ambiguity from a timer subject to time wrapping, said method comprising the steps of:

(a) activating a lower half of a total number of bits in said timer that repeat after a time period T;

(b) assigning a desired schedule start time of the lower half total number of bits as a reference time X;

(c) recording an actual received time of the lower half total number of bits as a reference time O; and

(d) determining whether references X and O occur during the same time period T or fall into a different time period (T2).

2. The method according to claim 1, wherein the timer comprises an IEEE 802.11 TSF timer.

3. The method according to claim 1, wherein step (d) further comprises identifying the references as a referring to a past time or a future time.

4. The method according to claim 3, wherein the reference values and the determination in step (d) are stored in a table.

5. The method according to claim 2, wherein the determination in step (d) further comprises determining whether the values of references X and O correspond to one of four possible cases, wherein a first case includes no timer wrap into a different time period and the scheduled start time X later than the actual received time O.

6. The method according to claim 2, wherein the determination in step (d) further comprises determining whether the values of references X and O correspond to one of four possible cases, wherein a first case comprises an indication of no

timer wrap into a different time period and the scheduled start time X coming before than the actual received time O.

7. The method according to claim 2, wherein the determination in step (d) further comprises determining whether the values of references X and O correspond to one of four possible cases, wherein a first case comprises an indication of a timer wrap into a different time period and the scheduled start time X coming before the actual received time O.

8. The method according to claim 2, wherein the determination in step (d) further comprises determining whether the values of references X and O correspond to one of four possible cases, wherein a first case comprises an indication of a timer wrap into a different time period and a scheduled start time X coming later than the actual received time O.

9. The method according to claim 1, wherein the period T of the timer in step (a) is of a predetermined fixed duration.

10. A method for determining whether or not a lower 32 bits of a Timing Synchronization Function (TSF) have wrapped into a different time period, said method comprising the steps of:

(a) assigning a desired scheduled lower 32 bit start time as a reference time X that is timed by a TSF timer;

(b) recording an actual received time of the lower 32 bit start time of the TSF timer as a reference time O;

(c) determining whether $X < O$ and performing sub-step (i) if affirmative and sub-step (ii) if negative:

(i) using a known time period T of a TSF timer determining whether $(O-X+T) < (X-O)$ when X is not greater than O; and

(i) (a) identifying the TSF timer as not being wrapped if $(O-X+T)$ is not less than $(X-O)$; or

(i) (b) identifying the TSF timer as being wrapped if (O-X+T) is less or equal than (X-O);

(ii) using a known time period T of a TSF timer determining whether

(X-O+T) < (O-X) when X is greater than O; and

(ii) (a) identifying the TSF timer as not being wrapped if (X-O+T) is not less than (O-X); or

(ii) (b) identifying the TSF timer as being wrapped if (X-O+T) is less or equal than (O-X).

11. The method according to claim 10, wherein the TSF comprises an 802.11e timer.

12. The method according to claim 10, wherein the period T of the timer in step (a) is of a predetermined fixed duration.

13. The method according to claim 12, wherein the time period T in step (c) is about 71 minutes.

14. A method for determining whether or not a timer has wrapped into another time period, said method comprising the steps of:

(a) assigning a desired schedule start time as a reference time X that is timed by a timer having a period of T and using only a lower 32 bits;

(b) recording an actual received start time of the timer as a reference time O;

(c) check if the desired scheduled start time X falls within an interval not greater than a timeout from O, where T >> timeout; and a station receives a schedule element containing a field having a start time represented by X at time O;

(d) if (0 < (O - X) < timeout) then X is a backwards reference; if (O + T - X) < (timeout) and then X is a backward reference; otherwise if the equations are inapplicable then X is a forward reference.

15. The method according to claim 14, wherein the timer comprises a Timing Synchronization Function (TSF).

16. The method according to claim 15, wherein the TSF timer comprises a 64 bit 802.11 TSF timer and the values X and O use a lower 32 bits out of a 64 bit total.

17. A method for determining whether or not a timer has wrapped into a different time period, said method comprising the steps of:

(a) assigning a desired schedule start time as a reference time X that is timed by a timer using only a lower 32 bits of a 64 bit total;

(b) recording an actual received time of the timer as a reference time O;

(c) determining if $|X-O| > M/2$, with M being a maximum TSF timer value, wherein if $|X-O|$ is less than M/2, the TSF timer is identified as not being wrapped, and wherein if $|X-O|$ is greater or equal than M/2, the timer is identified as being wrapped;

(d) determining whether X-O > Zero for both a wrapped condition and unwrapped condition;

(e) (i) if X-O > Zero for the Timer wrapped condition, deduce a backward reference case;

(e) (ii) if X-O is less or equal to for the Timer wrapped condition, deduce a forward reference case;

(f) (i) if X-O > Zero for the Timer unwrapped condition, deduce a forward reference; and

(f) (ii) if X-O is less or equal to Zero for the Timer unwrapped condition, deduce a forward reference case.

18. A computer program on a computer readable medium containing the method according to claim 1.

19. A computer program on a computer readable medium containing the method according to claim 10.

20. A computer program on a computer readable medium containing the method according to claim 14.

21. A computer program on a computer readable medium containing the method according to claim 17.

22. An apparatus for removing ambiguity from an IEEE 802.11e schedule element reference times, said apparatus comprising:

a 64-bit Timing Synchronization Function (TSF) that provides a timing function utilizing 32 of the 64 bits to provide a time period T;

a schedule element stored in a storage area that can be accessed by a Quality of Service Station (QSTA);

a Quality Access Point (QAP) and the (QSTA) both receive the schedule element frame 315 containing scheduled start times; and

a CPU having an algorithm module for determining whether the time period T has fallen into a past time or a future time period, depending on whether two or more predetermined reference elements are both within a same time period T, or fall in previous (past) or subsequent (future) time periods relative to time period T.